

# STUDIES ON THE GRASSES OF KHERI DISTRICT, UTTAR PRADESH<sup>1</sup>

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This paper gives an account of the grasses of Kheri district. A Dichotomous Key to the genera of Poaceae is included. Fifty four genera and seventy seven species are described. Ecological notes, phenology, local names and field numbers are provided to the species.

## INTRODUCTION

Kheri district in north Uttar Pradesh lies between 27°41' and 28°42'N. latitude and 80°2' and 81°19'E. longitude. The district is separated on the east from Bahraich district by river Kauriala, and has to its south Sitapur and Hardoi districts and, Shahjahanpur and Pilibhit districts to the west, and Nepal to the north, separated by Mohan river (Anon. 1927). The thick forest belts of the district are situated in the terai regions of the foot hills of Himalayas. The grasslands are well represented in between the sal forest of the district and are locally known as *Phantas*.

Seventy seven species of grasses occur in this region. Ecological notes, phenology, local names, occurrence, field numbers etc. have been recorded for the species enumerated.

### KEY TO THE GENERA OF FAMILY POACEAE (nom. alt. Gramineae)

1. Culms woody with culm sheath (reduced leaves) ..... *Dendrocalamus*
1. Culms not woody; leaves not reduced to culm sheath:
  2. Spikelets of two florets, the upper perfect and the lower staminate or neutral and

- usually falling off entirely together with glumes at maturity:
3. Male and female spikelets in separate inflorescence:
4. Plant glabrous or slightly hairy; caryopsis enclosed in stony bracts ..... *Coix*
4. Plant hairy; caryopsis enclosed in thick lower glumes ..... *Chionachne*
3. Spikelets all hermaphrodite with male or barren or hermaphrodite spikelets mixed in the same inflorescence:
5. Spikelets often paired; with one sessile and other pedicelled, glumes as long as the spikelets; upper lemma usually awned:
6. All spikelets alike:
7. Racemes on a short common axis or cles or racemously arranged on an elongated common axis:
8. Spikelets all pedicelled ..... *Imperata*
8. Spikelets one sessile, the other pedicelled:
9. Panicles narrow, villous to tomentose; glumes coriaceous ..... *Narenga*
9. Panicles wide, silky hairy; glumes membranous ..... *Saccharum*
7. Racemes on a short common axis or digitate or sometimes solitary:
10. Spikelets 2-flowered ..... *Eulaliopsis*
10. Spikelets 1-flowered:
  11. Lower glumes dorsally flattened or shallowly concave between the keels; upper lemma bidentate at the apex ..... *Eulalia*
  11. Lower glumes convex on the back; upper lemma stipiform ... *Pseudopogonatherum*
6. Sessile and pedicelled spikelets dissimilar:
  12. Joints and pedicels trigonous, rounded or flat:

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13. Upper lemma awned:
  14. Racemes many noded, not enclosed in a spathe like sheath  
..... *Ischaemum*
  14. Racemes 1-noded, partially enclosed into boat-shape, spathe.....*Apluda*
13. Upper lemma not awned:
  15. Sessile spikelets globose  
..... *Hackelochloa*
  15. Sessile spikelets not globose:
    16. Racemes compressed; spikelets of each pair similar.....*Hemarthria*
    16. Racemes cylindrical; spikelets of each pair dissimilar:
      17. Pedicelled spikelets distinct and more or less of same size  
..... *Rottboellia*
      17. Spikelets all sessile; pedicelled rudimentary ..... *Mnesithea*
  12. Joints and pedicels slender, rarely thickened upwards:
  18. Racemes in whorled panicles, never spatheate:
  19. Lower glumes not flattened on the back:
  20. Panicles dense, contracted  
..... *Pseudosorghum*
  20. Panicles lax, open ..... *Sorghum*
  19. Lower glumes flattened on the back:
    21. Spikelets triad, one sessile and two pedicelled ..... *Chrysopogon*
    21. Spikelets biad, one sessile and other pedicelled ..... *Vetiveria*
  18. Racemes digitate, subdigitate or in pairs or solitary terminal, usually spatheate:
  22. Lemma awned from the back  
..... *Arthraxon*
  22. Lemma awned from the tip or sinus:
    23. Margins of lower glumes of sessile spikelets sharply infolded, two keeled, awn glabrous:
      24. Lemma awned from the tip:
      25. Racemes in compound spatheate panicles ..... *Capillipedium*
      25. Racemes not in compound spatheate panicles:
        26. Lower involucreal glumes with pits  
..... *Bothriochloa*
        26. Involucreal glumes without pits ..... *Dichanthium*
      24. Lemma awned from a sinus:
        27. Plant aromatic: racemes binnate, supported by spathe arranged in panicles  
..... *Cymbopogon*
        27. Plant not aromatic racemes solitary terminal on the culms and branches  
..... *Schizachrium*
        23. Margins of lower glumes inturned and rounded at the sides; awn usually hairy:
        28. Racemes surrounded at the base by an involucre of homogamous, sessile, non-deciduous spikelets .....*Themeda*
        28. Racemes without an involucre  
..... *Heteropogon*
    5. Spikelets solitary or paired, more or less similar; glumes usually membranous, at the lower usually smaller or sometimes: suppressed: upper lemma usually awnless:
      29. Spikelets in open or contracted panicles:
        30. Spikelets in open panicles:
        31. Spikelets not supported by bristles:
          32. Spikelets gibbous laterally compressed ..... *Cyrtococcum*
          32. Spikelets not gibbous  
..... *Panicum*
        30. Spikelets in contracted spike like panicles ..... *Hymenachne*
      29. Spikelets in secundate spiciform racemes or false spikes:
  33. Upper lemma crustaceous or coriaceous:
    34. Spikelets adaxial:
      35. Glumes awned:
        36. Blades lanceolate to ovate  
..... *Oplismenus*
        36. Blades linear, narrow  
..... *Echinochloa*
      35. Glumes awnless:
        37. Lower glumes well developed:
          38. Aquatic plants ...*Paspalidium*
          38. Terrestrial or marshy plants  
..... *Urochloa*
        37. Lower glumes absent  
..... *Paspalum*
    34. Spikelets abaxial.....*Brachiaria*
  33. Upper lemma thinly cartilaginous usually with flat hyaline margin.....*Digitaria*
    31. Spikelets supported bristles:
    39. Bristles caducous, forming an involucre; upper lemma smooth.....*Pennisetum*

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39. Bristles persistent, solitary; upper lemma transversely rugose.....*Setaria*
2. Spikelets always with a single hermaphrodite floret; if two-flowered, with one of the floret barren, then lemmas as firm as glumes:
40. Spikelets arranged in open or contracted spikelike panicles:
41. Spikelets with 2 or more fertile florets:
42. Glumes shorter than the lowest florets:
43. Lemmas 5-many nerved.....*Poa*
43. Lemmas 1-3 nerved:
44. Spikelets in open, contracted or spikelike panicle . . . . .*Eragrostis*
44. Spikelets in open, contracted or spikelike panicle
45. Rachis ending in spikelets:
46. Spikelets falling entire of straight spikes which are numerous and crowded into long narrow dense panicles  
.....*Desmostachya*
46. Spikelets breaking up at maturity: spikes few to many.....*Eleusine*
42. Glumes longer than the lowest florets:
47. Lemmas and rachilla glabrous  
.....*Avena*
47. Lemmas and rachilla joints with long silky hairs .....*Phragmites*
41. Spikelets with one fertile floret:
48. Glumes minute or suppressed: fertile lemma and palea very similar in shape and texture:
49. Blade ovate-oblong or ovate-lanceolate with inflated sheath  
.....*Hygroryza*
49. Blade linear, acute or acuminate  
.....*Oryza*
48. Glumes well developed; fertile lemma and palea dissimilar:
50. Spikelets with 3-florets.....*Phalaris*
50. Spikelets with 1 to 2-florets:
51. Spikelets with 2-florets  
.....*Arundinella*
51. Spikelets with 1-floret:
52. Lemmas 1 to 3-nerved  
.....*Perotis*
52. Lemmas 5-nerved .....*Polypogon*

40. Spikelets arranged on one side of the tough-rachis:
53. Spikelets awned .....*Chloris*
53. Spikelets awnless .....*Cynodon*
45. Rachis ending in a sharp point  
.....*Dactyloctenium*

SPECIES LIST

1. *Dendrocalamus strictus* (Roxb.) Nees  
Occasionally in North Kheri forest division.  
K.K.S. 7684. *Local name*—Bans.
2. *Coix lacryma-jobi* Linn.  
In moist locations near villages. Rare;  
Fls. & Frs.: Sept.-December. KKS 4359.
3. *Chionachne koenigii* (Spreng.) Thw.  
Common in grasslands.  
Fls. & Frs.: August-November.  
KKS 4193, 4291, 7524.
4. *Imperata cylindrica* (Linn.) Beauv.  
Common in grasslands and in open grounds.  
Fls. & Frs.: June-October. KKS 7672, 8420. *Local name*—Bharuee.
5. *Narenga porphyrocoma* (Hance) Bor  
Occasionally in open areas and in grasslands.  
Fls. & Frs.: October-November. KKS 4294, 7844.
6. *Saccharum spontaneum* Linn.  
Common along river banks, in swamps and along the bunds of fields etc.;  
Fls. & Frs.: September-January. KKS 3024, 7500.  
*Local name*—Kans.
7. *Saccharum bengalense* Retz.  
Frequent in marshes and along railway lines.  
Fls. & Frs.: September-October. KKS 4330  
*Local name*—Munj.
8. *Eulaliopsis binata* (Retz.) Hubb.  
Occasionally in open dry areas near sal forests.

- Fls. & Frs.: October-February. KKS 7618.
9. *Eulalia leschenaultiana* (Decne) Ohwi  
Occasional in moist areas.  
Fls. & Frs.: September-November. KKS 7879.
  10. *Pseudopogonatherum contortum* A. Camus  
Frequent in grasslands.  
Fls. & Frs.: October-December. KKS 7865.
  11. *Ischaemum rugosum* Salib.  
Common in marshes and rice fields.  
Fls. & Frs.: September-December. KKS 7945, 8423.
  12. *Apluda mutica* Linn.  
Common in open grasslands and along railway lines.  
Fls. & Frs.: September-February. KKS 4188, 7787, 8534.
  13. *Hackelochloa granularis* (Linn.) O. Ktze.  
Frequent in moist places in sal forest and in grasslands.  
Fls. & Frs.: September-December. KKS 7397, 7788, 8520
  14. *Hemarthria compressa* (Linn.f.) R. Br.  
Common in marshy areas and in rice fields.  
Fls. & Frs.: July-September. KKS 8440, 8467.
  15. *Rottboellia exaltata* Linn. f.  
Frequent along water courses.  
Fls. & Frs.: August-November. KKS 7951.
  16. *Mnesithea laevis* (Retz.) Kunth  
Common in grasslands and in the moist bed of rice fields.  
Fls. & Frs.: July-December. KKS 7707.
  17. *Pseudosorghum fasciculare* (Roxb.) A. Camus  
Common in grasslands and along railway lines.  
Fls. & Frs.: September-December. KKS 7876, 7881, 7974.
  18. *Sorghum nitidum* (Vahl) Pers.  
Common in grasslands and along railway lines.  
Fls. & Frs.: September-December. KKS 4179, 4206, 4325.
  19. *S. halepense* (Linn.) Pers.  
Occasional in cultivated fields and along railway lines.  
Fls. & Frs.: September-December. KKS 8533.  
*Local name*—Ghamoy.
  20. *Chrysopogon aciculatus* (Retz.) Trin.  
Frequent in open wastelands.  
Fls. & Frs.: August-November. KKS 2984.
  21. *Vetiveria zizanioides* (Linn.) Nash  
Common in sal forests and marshy places.  
Fls. & Frs.: July-November. KKS 2983, 7550, 7764.  
*Local names*—Seenk, khas .
  22. *Arthraxon prionodes* (Steud.) Dandy  
Occurs occasionally in open grasslands.  
Fls. & Frs.: October-February. G. Saran 26286.
  23. *Capillipedium assimile* (Steud.) A. Camus  
Occurs commonly along railway lines.  
Fls. & Frs.: August-December. KKS 4182, 7979.
  24. *Bothriochloa intermedia* (R. Br.) A. Camus  
Common in grasslands.  
Fls. & Frs.: August-December. KKS 4191, 7686, 7937.
  25. *B. pertusa* (Linn.) A. Camus  
Common in grasslands and in dried up rice fields, wastelands.  
Fls. & Frs.: September-January. KKS 8540; 8551.  
*Local name*—Sandhur.
  26. *B. kuntzeana* (Hack.) Hern.  
Occasional in open areas and in grasslands  
Fls. & Frs.: September-January. KKS 7984.

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27. *Dichanthium annulatum* (Forsk.) Stapf  
Common in lawns and in wastelands.  
Fls. & Frs.: August-January. KKS 7238, 7600, 7619, 8332.
28. *Cymbopogon osmastonii* Parker  
Occasional in the north Kheri forest division along forest roads. The grass is endemic to this district.  
Fls. & Frs.: September-December. KKS 7877.
29. *C. jwarancusa* (Jones) Schult.  
In open areas. Rare.  
Fls. & Frs.: August-December. KKS 7181.  
*Local name*—Jarakus.
30. *C. flexuosus* (Nees) Wasts. var. *microstachys* (Hook. f.) Bor  
Frequent in grasslands.  
Fls. & Frs.: September-December. KKS 4315.
31. *Schizachyrium brevifolium* (Sw.) Nees  
Occasional in open areas.  
Fls. & Frs.: September-December. KKS 7839.
32. *Themeda arundinacea* (Roxb.) Ridley  
Common in low-lying areas in sal forests and grasslands.  
Fls. & Frs.: August-December. KKS 4211, 8554.  
*Local name*—Ulla.
33. *Heteropogon contortus* (Linn.) Beauv. ex R. & S.  
Common in grasslands and in open wastelands.  
Fls. & Frs.: September-December. KKS 4274, 7838.
34. *Cyrtococcum patens* (Linn.) A. Camus  
Frequent in low-lying areas and other moist places.  
Fls. & Frs.: August-November. KKS 7536.
35. *Panicum austro-asiaticum* Ohwi  
Frequent in moist places.
- Fls. & Frs.: September-December. KKS 8524.
36. *P. trypheron* Schult.  
Frequent in cultivated fields and in grasslands.  
Fls. & Frs.: August-December. KKS 7722.
37. *P. paludosum* Roxb.  
Common in marshy places, still waters and banks of tanks, ponds throughout the district.  
Fls. & Frs.: September-December. KKS 7730, 8473, 8563.
38. *Hymenachne pseudointerrupta* C. Muell  
Occasional in marshy areas in South Kheri forest division.  
Fls. & Frs.: September-December. KKS 7874.
39. *Oplismenus compositus* (Linn.) Beauv.  
Frequently forms a dense, herbaceous, undergrowth in moist, shady areas of orchards.  
Fls. & Frs.: August-January. KKS 7822.
40. *O. burmanni* (Retz.) Beauv.  
Common in moist shady areas in orchards and in forests.  
Fls. & Frs. September-November. KKS 7771, 7821.
41. *Echinochloa stagnina* (Retz.) P. Beauv.  
Common in stagnant ditches and banks of ponds etc.  
Fls. & Frs.: August-December. KKS 7824, 8501.
42. *E. colonum* (Linn.) Link.  
Common in rice fields and other marshy places.  
Fls. & Frs.: July-November. KKS 7523, 8417.
43. *E. crus-galli* (Linn.) Beauv.  
Common in moist places near ponds, ditches and rice fields of the district.  
Fls. & Frs.: August-November. KKS 7761.  
*Local name*—Sawan.

44. *Paspalidium flavidum* (Retz.) A. Camus  
Occurs commonly in grasslands and waste-lands.  
Fls. & Frs.: July-November. KKS 7866, 8424, 8508.
45. *P. punctatum* (Burm. f.) A. Camus  
Common in moist places and in rice fields.  
Fls. & Frs.: August-December. KKS 8475.
46. *Urochloa panicoides* Beauv.  
Common in moist places and in pastures.  
Fls. & Frs.: August-November. KKS 8429.
47. *Paspalum distichum* Linn.  
Common on moist banks of ponds and ditches.  
Fls. & Frs.: June-September. KKS 7417, 8427.
48. *P. commersonii* Lamk.  
Occurs occasionally in rice fields.  
Fls. & Frs.: September-January. KKS 2988.
49. *Brachiaria reptans* (Linn.) Gard. & Hubb.  
Frequent in moist places and in rice fields.  
Fls. & Frs.: September-January. KKS 8549.
50. *B. distachya* (Linn.) Stapf  
Frequent in grasslands.  
Fls. & Frs.: August-December. KKS 8444.
51. *B. ramosa* (Linn.) Stapf  
Frequent in moist wastelands.  
Fls. & Frs.: July-November. KKS 8418.
52. *B. kurzii* (Hook. f.) A Camus  
Occurs occasionally in moist places.  
Fls. & Frs.: August-November. KKS 8465.
53. *Digitaria adscendens* (H.B. & K.) Henr.  
Frequent in open areas.  
Fls. & Frs.: July-November. KKS 8553.
54. *Pennisetum polystachyon* (Linn.) Schult:  
Occurs occasionally in grasslands.  
Fls. & Frs.: July-November. KKS 7645.
55. *Setaria verticillata* (Linn.) Beauv.  
Frequent in moist areas.  
Fls. & Frs.: August-November. KKS 3067.
56. *S. glauca* (Linn.) Beauv.  
Common in wastelands and in open grasslands.  
Fls. & Frs.: August-October. KKS 3029, 7786.
57. *S. tomentosa* (Roxb.) Kunth  
Occurs commonly in moist grassland.  
Fls. & Frs.: August-December. KKS 7572.
58. *Poa annua* Linn.  
Occurs occasionally on moist ground.  
Fls. & Frs.: December-February. KKS 7890.
59. *Eragrostis tennella* (Linn.) P. Beauv. ex R. & S.  
Occurs commonly in moist places.  
Fls. & Frs.: September-February. KKS 4187, 7818, 7845.
60. *E. japonica* (Thunb.) Trin.  
Occurs commonly in moist places in wastelands and in grasslands.  
Fls. & Frs.: September-February. KKS 4187, 7810, 7845.
61. *E. atrovirens* (Desf.) Trin. ex Steud.  
Frequent in grasslands near moist places.  
Fls. & Frs.: August-November. KKS 8435, 8476.
62. *E. unioloides* (Retz.) Nees ex Steud.  
Occurs commonly in moist shady places.  
Fls. & Frs.: September-November. KKS 4214, 4297, 7376.
63. *Desmostachya bipinnata* (Linn.) Stapf  
Frequent in grasslands.  
Fls. & Frs.: June-November. KKS 2979, 4108, 8552.  
Local name—Kusha.
64. *Eleusine indica* (Linn.) Gaertn.  
Occurs as a weed in cultivated fields.  
Fls. & Frs.: August-November. KKS 8433.
65. *Avena fatua* Linn.  
Occurs occasionally in cultivated wheat fields.

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- Fls. & Frs.: February-April. KKS 7650.  
*Local name*—Jae.
66. *Phragmites maxima* (Forsk). Blatt. & McC.  
 Common in marshy places and near streams.  
 Fls. & Frs.: December-February. KKS 2818, 2997, 4229.  
*Local name*—Narkul.
67. *Hygoriza aristata* (Retz.) Nees & W.&A.  
 Occurs commonly in lakes and ponds throughout the district.  
 Fls. & Frs.: October-February. KKS 7454.
68. *Oryza sativa* Linn.  
 Cultivated throughout the district.  
 Fls. & Frs.: September-November. KKS 7758.  
*Local name*—Dhan.
69. *O. rufipogon* Griff.  
 Occurs commonly mixed with paddy in cultivated fields.  
 Fls. & Frs.: October-November. KKS 7746, 8487.  
*Local name*—Pasae.
70. *Phalaris minor* Retz.  
 Frequent as a weed in wheat fields.  
 Fls. & Frs.: January-April. KKS 7645.  
*Local name*—Senhu.
71. *Arundinella bengalensis* (Spreng.) Druce  
 Frequent in moist shady places.  
 Fls. & Frs.: July-October. KKS 8539.
72. *Perotis indica* (Linn.) O. Ktze.  
 Frequent in open wastelands and shady places.
- Fls. & Frs.: August-October. KKS 7432, 7720.
73. *Polypogon monspeliensis* (Linn.) Desf.  
 Commonly in moist, sandy areas and in sal forests of the district.  
 Fls. & Frs.: January-March. KKS 2813, 7117, 7243.
74. *Chloris dolichostachya* Lagasca  
 Frequent in moist shady places.  
 Fls. & Frs.: August-November. KKS 4151.
75. *C. barbata* (Linn.) Sw.  
 Occurs commonly in open grasslands in sandy places.  
 Fls. & Frs.: August-November. KKS 4359.
76. *Cynodon dactylon* (Linn.) Pers.  
 Occurs commonly in wet and dry location.  
 Fls. & Frs.: Most part of the year KKS 8381.  
*Local names*—Ghas, Dub.
77. *Dactyloctenium aegypticum* (Linn.) Beauv.  
 Occurs as a weed in waste sandy areas and cultivated fields.  
 Fls. & Frs.: June-November. KKS 4386.

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REFERENCE

ANONYMOUS (1927): Gazetteer of Kheri district. U.P., Allahabad.